



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,931	04/19/2005	Gerard De Haan	NL 021030	5660
24737 7590 05/12/2008 PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510				
EXAMINER TORRES, JOSE				
ART UNIT		PAPER NUMBER		
2624				
MAIL DATE		DELIVERY MODE		
05/12/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/531,931

Applicant(s)

DE HAAN ET AL.

Examiner

JOSE M. TORRES

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CIS-100)
Paper No(s)/Mail Date 04/14/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Comments

1. The Preliminary Amendment filed on April 19, 2005 has been entered and made of record.

Abstract

2. The Abstract of the Disclosure does not commence on a separate sheet in accordance with 37 C.F.R. §1.52(b)(4). A new Abstract of the Disclosure is required and must be presented on a separate sheet, apart from any other text. See MPEP §608.01(b).

Priority

3. A copy of the International Application (PCT/IB03/04352) has not yet been received for this Application as required under 35 U.S.C. §371.

Appropriate correction is required.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

Art Unit: 2624

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

4. The disclosure is objected to because of the following informalities:

- The Section heading "BACKGROUND OF THE INVENTION" and "(1) Field of the Invention" is missing. Examiner recommends placing the headings in Page 1 between the Title of the Invention and the first line of the first paragraph.
- The Section heading "(2) Description of Related Art" is missing. Examiner recommends placing the heading at the beginning of Page 2.

- The Section heading "BRIEF SUMMARY OF THE INVENTION" is missing. Examiner recommends placing the heading between lines 12 and 15 in Page 5.
- The Section heading "BRIEF DESCRIPTION OF THE DRAWINGS" is missing. Examiner recommends placing the heading at the beginning of Page 9.
- The Section heading "DETAILED DESCRIPTION OF THE INVENTION" is missing. Examiner recommends placing the heading between lines 16 and 19 in Page 9.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 3, 4 and 10-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Yang et al. (U.S. Pat. No. 7,042,512).

Re claims 1 and 13: Yang et al. disclose an image processing unit/method for computing a sequence of output images on basis of a sequence of input images, comprising: a motion estimation unit (FIG. 4, "Motion Estimation Unit 410") for computing a motion vector field (FIG. 6A, "motion vectors of a video image") on

basis of the input images ("($n-1$)-th and ($n+1$)-th fields"), the motion vector field comprising a first motion vector belonging to a first group of pixels and a second motion vector belonging to a second group of pixels (Col. 3 line 58 through Col. 4 line 8 and line 54 through Col. 5 line 6); a quality measurement unit (FIG. 4, "Motion Analysis Unit **422**") for computing a value of a quality measure for the motion vector field ("the motion analysis unit **422** analyses the motion vectors estimated from a current scene or field to estimate existence/non-existence of global motion and to estimate a direction of the global motion", Col. 4 lines 9-21); an interpolation unit (FIG. 4, "Motion Compensated Interpolation Unit **440** and Spatio-Temporal Interpolation Unit **450**") for computing a first one of the output images ("progressive image") by means of interpolation pixel values of the input images, the interpolation being based on the motion vector field ("using a corresponding motion vector estimated by the motion estimation unit **410**", Col. 4 lines 22-41); control means (FIG. 4, "Adaptive Selection Unit **460**") to control the interpolation unit on basis of quality measure, characterized in that the quality measurement unit is arranged to compute the value of the quality measure on basis of maximum difference between the first motion vector and the second motion vector ("a motion type is determined according to input motion type information", Col. 4 lines 31-38 and Col. 5 lines 37-67).

Re claim 3: Yang et al. disclose the interpolation unit is arranged to perform a motion compensated interpolation of the pixel values of the input images on

basis of the motion vector field, if the value of the quality measure is lower than a predetermined threshold ("threshold value") and is arranged to perform an alternative interpolation of the pixel values of the input images, if the value of the quality measure is higher than the predetermined threshold (Col. 5 line 59 through Col. 6 line 32).

Re claim 4: Yang et al. disclose the alternative interpolation comprises a non-motion compensated interpolation ("Spatio-Temporal Interpolation" Col. 5 line 59 through Col. 6 line 32).

Re claim 10: Yang et al. disclose an image processing apparatus ("de-interlacing apparatus") comprising: receiving means for receiving a signal corresponding to a sequence of input images (Since the invention is related to the conversion of a format of a video signal suitable to be displayed on a screen of a recent personal computer of high definition television, it is inherent that the apparatus comprises some type of reception means to receive the INPUT SIGNAL as shown in Figure 4.); and an image processing unit for computing a sequence of output images on basis of the sequence of input images, as claimed in claim 1 (Refer to Claim 1 above and Col. 1 lines 15-30).

Re claim 11: Yang et al. disclose a display device for displaying the output images ("high-definition television which displays images usually using

Art Unit: 2624

progressive scanning, it is necessary to generate video lines to fill blank lines using a de-interlacing method.”, Col. 1 lines 23-30).

Re claim 12: Yang et al. disclose that is a TV “high-definition television”, Col. 1 lines 23-30).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. in view of Keating et al. (U.S. Pat. No. 5,162,907). The teachings of Yang et al. have been discussed above.

As to claims 2 and 7, Yang et al. does not explicitly disclose the first group of pixels is a neighboring group of pixels of the second group of pixels, and the first group is located horizontally from the second group.

Keating et al. teaches the first group of pixels is a neighboring group of pixels of the second group of pixels (FIG. 7, “Search Blocks 1A, 2A, 3A”, Col. 6 lines 12-25).

Therefore, in view of Keating et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang et al. by incorporating the group of pixels as the search blocks located horizontally from each other in order to

improve the detection of motion and the accuracy of motion estimation (Col. 5 line 61 through Col. 6 line 11).

8. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. in view of Hackett et al. (U.S. Pat. No. 5,642,170). The teachings of Yang et al. have been discussed above.

As to claim 5, Yang et al. does not explicitly disclose the alternative interpolation comprises a replication of the pixel values of the input images.

Hackett et al. teaches the alternative interpolation comprises a replication of the pixel values of the input images ("repeating the original fields", Col. 4 lines 7-14).

Therefore, in view of Hackett et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang et al. by incorporating the repetition of original fields when motion compensating processing is impossible in order to improve video quality by removing a double image when data in the new fields is displayed in the wrong temporal position (Col. 1 lines 38-47).

9. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. in view of Keating et al. as applied to claim 2 above, and further in view of De Haan et al. (U.S. Pat. No. 5,929,919). The teachings of Yang et al. and Keating et al. have been discussed above.

As to claim 6, Yang et al. and Keating et al. does not explicitly disclose the quality measurement unit is arranged to compute the value of the quality measure on

basis of a maximum difference between the horizontal component of the first motion vector and the horizontal component of the second motion vector.

De Haan et al. teaches the quality measurement unit (FIG. 6, "Upconverter **300**") is arranged to compute the value of the quality measure on basis of a maximum difference between the horizontal component of the first motion vector and the horizontal component of the second motion vector (Col. 3 line 63 through Col. 4 line 14, Col. 5 lines 13-22, and Claim 3).

Therefore, in view of De Haan et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Yang et al. and Keating et al. by incorporating the upconverter to compute the differences between the horizontal components of the motion vectors in order to reduce the motion judder disturbance (Col. 1 line 17 through Col. 2 line 2).

10. Claims 8 and 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. in view of De Haan et al. The teachings of Yang et al. have been discussed above.

As to claims 8 and 9, Yang et al. does not explicitly disclose the predetermined threshold is an adaptive threshold based on match errors being computed for the first and the second motion vectors.

De Haan et al. teaches the predetermined threshold is an adaptive threshold ("Acceptable Values") based on match errors ("Error Signal Err") being computed for the first and the second motion vectors (Col. 3 line 63 through Col. 4 line 44).

Therefore, in view of DeHaan et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang et al. by incorporating the acceptable values to be adapted based on an error signal computed from the motion vectors in order to (Col. 1 line 17 through Col. 2 line 2).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Robert et al. disclose a Process and Device for Temporal Image Interpolation, With Corrected Movement Compensation, and Crinon et al. disclose a Resolution Improvement from Multiple Images of a Scene Containing Motion at Fractional Pixel Values.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSE M. TORRES whose telephone number is (571)270-1356. The examiner can normally be reached on M-F: 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

Art Unit: 2624

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMT

05/05/2008

/Jingge Wu/

Supervisory Patent Examiner, Art Unit 2624